

Specifications for Regenerative Air Street Sweeper

Acceptable brands/models: Elgin Crosswind 1, Schwarze A7 or equal

SPECIAL INSTRUCTIONS

All bidders are expected to quote upon a manufacturer's latest standard conventional model truck complete with all standard equipment plus any optional or special equipment required meeting these specifications.

NOTE: Unit(s) shall meet the US EPA emissions standards

MILEAGE, ODOMETER READING

The maximum mileage allowable for any vehicle to be considered acceptable shall be 1000 miles. It shall be the responsibility of the successful bidder to make required arrangements to ensure that the mileage/odometer reading does not exceed the maximum miles listed when the vehicles are delivered to the using agency for final acceptance.

DELIVERY REQUIREMENTS

Unit will be inspected and must be 100% operational before payment is processed. If unit is not 100% operational, the successful bidder must make necessary adjustments or repairs before the units will be acceptable. TDOT regional garage manager at delivery location shall be responsible for final inspection/approval.

DOCUMENTS

Owner's manual, warranty papers, extra key, invoice and manufacturer's statement of origin are to be furnished with each unit. The manufacturer's statement of origin shall be executed in the name of:

Tennessee Department of Transportation
505 Deaderick Street
Nashville, TN. 37243-0346

Operations, parts and service manuals for all equipment along with wiring diagrams for additional equipment shall be provided upon delivery of the unit(s).

Chassis

Chassis: shall be conventional design International, Freightliner or equal with 33,000 GVW rating. Bidder shall state make, model and point of manufacture. Wheelbase shall not exceed 184 inches. Cab to axle shall be not more than 115.5 inches. Yield strength of the Rail, High Strength, 80,000 PSI. For safety, the rear of the sweeper shall be equipped with a rear panel to provide under ride protection. When dumping debris, material shall not be discharged on top of the rear panel. Frame mounted front tow hooks shall be provided. One (1) 50-gallon fuel tank shall be easily accessible without raising or shifting any components. A fuel gauge, in cab, shall be supplied. Sight tube is not acceptable.

Engine: shall be, Cummins ISB 6.7-200, turbocharged diesel, 200 HP @ 2300 RPM, 520ft-lbs. @ 1600 RPM or equal. Truck engine shall be equipped with a single vertical exhaust system. The cooling system shall be protected to -34 degrees F. Engine shall be equipped with 150-volt block heater.

Transmission: shall be an Allison 2500 RDS series automatic transmission or equal.

A variable speed device shall be installed between the chassis engine and the Allison transmission. Variable speed device shall produce a 1:1 speed ratio between the chassis engine and the Allison transmission while the sweeper is in "Road Mode". Variable speed device shall have a selectable "Road Mode", controlling the chassis engine speed and transmission shifts normally through accelerator pedal(s); i.e. driving the chassis on the road for transport. Variable speed device shall allow chassis accelerator pedal(s) to control input speed to the Allison transmission while chassis engine speed remains constant when the sweeper is in "Work Mode". Variable speed device shall have a selectable "Work Mode", as controlling and operating the sweeper using variable speed device to allow complete utilization of sweeper system. For ease of operation, the variable speed device shall be in-cab controlled via singular push-button switch located on control console. Engaging either "Work Mode" or "Road Mode" shall NOT require the parking brake to be engaged or the chassis to be placed into neutral.

Axle: Single-speed rear axle shall have a ratio of 7.17:1 for proper sweeping speeds. Front axle shall be 12,000 lbs. and be equipped with taper leaf front suspension and shock absorbers. The rear axle shall be 21,000 lbs.

Tires shall be tubeless radial tires 14 ply JJR22.5 "G" load rated. The front and rear tires and rims shall be interchangeable. The rear axle shall include dual tires.

Rims shall be 10-hole steel hub piloted 22.5 x 8.25 white in color. Parking brake shall be spring applied rear wheel drum and shoe. Brakes shall be full air brakes S Cam with an 18.7 CFM capacity compressor, with automatic slack adjusters and ABS. Air system shall include a Bendix AD-9 air dryer with heater.

Cab:

Steering shall be full power with dual operator controls.

Seats shall be basic adjustable, high back air suspension, covered with cloth and include 3-point seat belts, orange in color.

Sweeper shall include two (2) heated and remote control, outside west coast type mirrors with lower 8-inch convex mirrors. 8 inch outside RH and LH fender mirrors shall be mounted forward of the front wheels.

Switches shall be illuminated so that they can be readily identified without the use of the cab dome light. Switches shall be clearly identified by name and symbol.

Cab interior environment shall be fully air-conditioned including a fresh air heater/ventilator/defroster. Cab shall have full flow through ventilation for optimal temperature control and operator comfort. Wipers shall have intermittent feature. Interior of cab shall have acoustical insulation and center sweeper console. All glass shall be tinted safety glass. Each operator position shall have adjustable sun visor. Doors shall be keyed alike. Side windows shall have defogger. Cab shall include 12V power supply. Cab shall include an AM/FM/WB Radio w/ CD Player, Bluetooth and Microphone, USB, Front and Rear Aux. Inputs. Speakers and antenna shall be included. Dual Electric horns shall be provided.

Instrument panel(s):

Chassis left and right-side operator instrument panels shall be chassis OEM, full vision illuminated with tachometer, speedometer, odometer, trip odometer, hour meter, trip hour meter, fuel gauge, water temperature gauge, oil pressure gauge, transmission temperature gauge, air pressure gauge, and volt gauge. Console shall have left/right primary driver switch.

Chassis engine instruments shall include warning light and chime for low coolant level and high coolant temperature to warn the operator of a potential problem before any damage to the engine occurs. Hydraulic functions shall be controlled by rocker switches located in the cab mounted control panel. All console switches including transmission controls and all gauges shall be illuminated. Cab mounted air restriction indicator with graduations shall be included.

Electrical: Chassis shall have two (2) maintenance free batteries rated at not less than 1900 CCA total, 12 volts. Chassis engine shall have a 160-amp alternator. Chassis lighting shall include sealed multi-beam halogen headlights, stop lights with daytime running feature, taillights, backup lights, license plate lights, clearance lights, signal lights, illuminated gauges and instrument panel, and directional lights with a hazard switch.

Safety Equipment & Accessories

A rear mounted slow-moving vehicle sign shall be added for visibility during operation. An in-cab mounted 5 lb. (2.2 kg) ABC fire extinguisher shall be included. Sweeper shall have an electronic back-up alarm and a back-up camera with night vision. Two (2) LED work lights shall be supplied for both left- and right-hand brooms. Each work light shall have an independent in-cab control switch. LED Strobes Cab/Front and Hopper/Rear with LED Arrow stick shall be provided. All electrical circuits must be protected by automotive style fuses.

Operating Controls & Displays

Sweeper shall be equipped with dual steering and controls for left or right side operation of the sweeper. The dual steering and controls shall not be installed by the sweeper manufacturer. Auxiliary engine control and gauges shall be mounted on a left to right rotating control console inside the cab. They shall consist of; keyed ignition, electronic throttle control, leaf bleeder control, oil pressure gauge, water temperature gauge, voltmeter, tachometer, and hour meter. All gauges shall be full color, high resolution display. The display shall include a diagnostic gauge with the ability to read and record engine error codes and engine load and fuel consumption. Hydraulic temperature, dust control water level, leaf bleeder position indicator, hopper tilt status, parking brake status, and sweeper standby controller status shall be displayed on a full color, high resolution display mounted on the sweeper console. The console shall have independent switches for operating left gutter broom, tilt, GEO and variable speed, right gutter broom, tilt, GEO and variable speed, and pickup head. All switches shall be lighted and have

international symbols for easy identification. The console shall have individual switches for water pump on/off switch and low water level warning light. There shall be independent water control switches for left gutter broom, right gutter broom, pickup head, hopper, front bumper, and nozzles at front axles. All switches shall be lighted and have international symbols for easy identification. Console shall have independent switches for each gutter broom light, rear dump light, and safety strobes. All sweeper main electrical systems shall be separately fused at the systems locker. The console shall feature a "stand by" control that allows one touch return to sweeping after equipment selection. The standby feature shall be switch selectable to provide lift in reverse or sweep in reverse. Instrument readings that are out of range including low hydraulic oil level, hydraulic oil filter restriction, communication error, spray water filter dirty, spray water low, high dump angle warning, unsafe dump angle lock out, parking brake not set shall display a warning icon and sound a warning chime. Non safety chimes may be acknowledged for 90 seconds.

OR

All sweeper controls shall be mounted on a stationary central console that allows for use from either right or left positions. For ease of operation, the variable speed device shall be in-cab controlled via singular push-button switch located on control console. Engaging either "Work Mode" or "Road Mode" shall NOT require the parking brake to be engaged or the chassis to be placed into neutral. "Work Mode" shall be selectable when vehicle speed is at or below 5 MPH. For quick departure from sweeping application(s) or for sweeper transport, "Road Mode" must be selectable while vehicle is moving. The controls shall include sweep, spray water and lighting functions. The controls for sweeping, spray water, and lighting functions shall be rocker switches. Controls for "Mode Select", work throttle, side broom down pressure shall be located on the control console. Controls for sweep system shall include sweep/resume feature; allowing the automatic raise when chassis transmission gear selector is put into reverse of side brooms and pickup head. Control for sweeper shall include dump mode; allowing quick unloading of debris without the blower running. Sweeper instruments shall include blower tachometer, hour meter, fuel, and voltage for complete information for the operator on the condition of the sweeper system, visible from both operator positions. Variable speed device instruments shall include an oil level sight gauge for ease of daily maintenance. Sweeper instruments shall include diagnostic information for the sweeper and sweeper functional information to include water level, sweeping mode, transport mode, and dump mode. Sweeper instruments shall include a "raised" hopper indicator, an "open" hopper door indicator and a "full" hopper indicator to notify the operator. Controls shall include an in-cab switch for vacuum enhancer, with percent open/close display for increased operator awareness for adjustment of pickup head vacuum level for continuous pickup of leaves and bulky debris.

Sweeper Engine

Auxiliary if required

The sweeper engine shall be an auxiliary diesel engine. The engine shall be a John Deere turbo charged four-cylinder with Tier IV final emission control with a horsepower rating of not less than 134 hp @ 2400 RPM and shall provide a peak torque rating of not less than 398 ft/lb. at 1,600 RPM. The minimum displacement shall not be less than 275 cubic inches. Engine shall be made in North America. Engine shall be equipped with a full-flow spin-on oil filter, fuel filter and fuel water separator. The air intake shall be at least 8 feet above the ground level. Engine shall be equipped with a 3-point safety engine shutdown device that shuts down the engine for low oil pressure, high coolant temperature, and low coolant level. Auxiliary engine shall be warranted by engine manufacturer for not less than 2 years or 2,000 hrs. (whichever occurs first). Emissions shall be warranted for not less than 5 years or 3,000 hrs. (whichever occurs first). A twelve (12) volt electrical system, electrical starter and 90-amp alternator shall be provided. Sweeper shall have resettable circuit breakers and automotive fuses. Sweeper auxiliary engine shall share a 50-gallon fuel tank minimum and batteries with chassis engine. Auxiliary engine, muffler, fuel tank, battery box, hydraulic tank and cooler shall be protected by a shroud. Dailey engine maintenance points, including engine oil dipstick removal, engine air cleaner removal, visual check of hydraulic oil and engine coolant must be able to be performed from ground level without the aid of a ladder or steps or lifting the hopper. Hopper shall include an expanded metal screen engine cover to protect the engine and reduce buildup of leaves in the engine compartment. This engine cover shall also include three tree limb protection bars.

OR

Sweeper Engine Drive

The sweeper shall be equipped with a variable speed device approved at 560 ft-lb of input torque and 240 (179 kW) of input power. The variable speed device shall be located between the chassis engine and the Allison transmission. The variable speed device shall produce a 1:1 speed ratio between the chassis engine and the Allison transmission while in "Road Mode". Variable speed device shall have a selectable "Road Mode" to control the chassis engine speed and transmission shifts normally through accelerator pedal(s). Variable speed device shall allow chassis accelerator pedal(s) to control input speed to the Allison transmission while chassis engine speed remains constant when the sweeper is in "Work Mode". Variable speed device shall have a selectable "Work Mode", as controlling and operating the sweeper using variable speed device to allow complete utilization of sweeper system. For ease of operation, the variable speed device shall be in-cab controlled via singular push-button switch located on

control console. Engaging either "Work Mode" or "Road Mode" shall NOT require the parking brake to be engaged or the chassis to be placed into neutral. The variable speed device shall be capable of directly driving hydraulic pumps without the use of auxiliary Power Take Off's (PTO's) or belt drive systems. The variable speed device shall be a planetary gearbox design. The variable speed device shall operate directly off the chassis engine coupling in all modes - "Work Mode" or "Road Mode". For the sweeper, the variable speed device PTO shall power a blower drive and sweeper pump through a conventional drive shaft. sweeper with variable speed device shall not require an auxiliary engine and their associated EPA Tier 4 final emissions systems; Diesel Oxidation Catalyst (DOC), Diesel Particulate Filter (DPF) and/or Selective Catalytic Reduction (SCR) systems. The front cowling shall be enclosed on both sides by two access doors, one on each side of the sweeper body.

Hydraulic & Pneumatic System(s)

Hydraulic power shall be used to operate all broom rotation and lifting functions. Hydraulic pressure shall be set at 2500 PSI for all hydraulic functions. Sweeper shall utilize a multi-stage gear driven hydraulic pump, minimum 25-gallon vented hydraulic reservoir, a spin-on 10 micron return filter, and high-pressure hoses and fittings. The hydraulic reservoir shall have a tank mounted level and temperature indicator. The hydraulic reservoir shall be mounted above the hydraulic pump. The hydraulic system shall have a 9,000 BTU oil to air radiator type hydraulic oil cooler. The hydraulic tank shall have shut-off valves for hydraulic oil filter change. The hydraulic system shall have quick disconnect relief pressure check ports mounted in the hydraulic manifold(s). No sweeper hydraulic lines shall run into or through the cab. Hydraulic valves shall have built-in diagnostic system lighting for troubleshooting hydraulic flow and electrical power. A 12-volt DC hydraulic backup system shall be provided which may be used to operate all hydraulic functions without starting the auxiliary engine. The hydraulic system shall have an extended warranty that includes 2 years on motors and valves and 5 years on pumps and fittings.

OR

The variable speed device shall be capable of directly driving hydraulic pumps without the use of auxiliary PTO's or belt drive systems. A variable - piston type - displacement pump with 4.2 cu-in (68.8 cc)/rev rating shall be used for the sweeper blower system. A gear driven hydraulic pump with a flow capacity of 19.5 GPM (73.8 LPM) @ 3400 RPM shall be used for the sweeper brooms, hopper dump, and pickup head raise/lower systems. Blower drive motor shall be hydraulic bent axis compact type, closed loop system, to achieve effective blower speed of 3300 RPM while providing ease-of-alignment with drive coupling. Reservoir capacity shall be not less than 23 (87 L) gallons and have an exterior sight gauge. The reservoir must be located

for quick inspections without tilting the hopper. All hydraulic circuits shall have quick disconnect pressure check ports. Hydraulic oil cooler shall be standard, equipped with hydraulically driven cooling fan that is accessible without raising the hopper. The hydraulic system shall operate below 200F. The return line to have 10-micron absolute spin-on filter as standard. The charge pump flow filter shall be 6-micron absolute canister type. The reservoir vent shall be equipped with 10-micron absolute spin-on breather filter. The system shall contain two 100-mesh stainless-steel suction strainers. All high-pressure fittings shall be O-Ring Face Seal (ORFS) type. An in-cab, control console mounted, low hydraulic oil volume and high hydraulic oil temperature alarm shall be provided. There shall be a PR4 protector type pressure protector for the chassis air system. A separate air tank for all sweeper air components shall be provided. All pneumatic cylinders shall be interchangeable. All pneumatic cylinders must be rated to 150 PSI and have a separate rod seal and wiper. Each cylinder shall be controlled by a single, two position, solenoid valve mounted on a manifold with common input and exhaust. There shall be a filter with a polycarbonate bowl to filter out contaminants down to 5 microns.

Dust Separator

A centrifugal dust separator with a minimum 29,000 cubic inch volumetric area shall be supplied inside hopper to remove airborne dust from the air stream. The dust separator shall be designed so that it will not plug with normally encountered debris. The dust separator shall have a clean-out door that opens automatically and discharges debris from the separator when the hopper is raised.

OR

Dust separation from the air stream shall be accomplished by means of a Labyrinth style dust separator that is installed at the air return outlet of the hopper. The separator shall be designed so that it will not plug with regular debris. To allow inspection and cleaning of the separator interior, the dust separator shall have minimum of two hinged inspection doors. Both doors are self-opening when tilting the hopper. To allow automatic discharge of debris when tilting the hopper, the dust separator shall have a self-opening door made of abrasion resistant steel.

Hopper

The volumetric capacity of the hopper shall not be less than 8.4 cubic yards. The usable capacity shall not be less than 7.0 cubic yards. Hopper screen shall be a High Strength Stainless-steel, two piece saw-tooth design. Hopper screen shall be a minimum of 5,615 square inches. Hopper screens shall have 2 hinges on each screen, allowing the screen to drop down from one side. Dumping shall be accomplished hydraulically by tilting the hopper a minimum of 48

degrees. Contents shall be dumped to the rear of the vehicle at a height of 36 inches. The dumping system shall include twin dumping cylinders with dimensions of 4" X 16". The hopper floor shall be sloped 3 degrees, making a total dump angle of 51 degrees. Hopper roof, sides, floor, rear door, separator, separator screens and bulkheads shall be constructed from stainless-steel. Dump door shall be hydraulically opened, closed, and locked. Operation of the hopper dump door shall be accomplished from inside or outside the cab. Large 15" X 32" inspection doors shall be provided on left and right sides of hopper. The hopper shall be airtight using rubber seals on all doors and openings. Weatherproof dump switches shall be located outside directly behind cab. There shall be one switch for each function: raising and lowering the hopper to the dump position, opening and closing the dump door, and turning the 2 rear bumper mounted flood lights on for night dumping. The hopper body structure, excluding the inlet and outlet wear tubes, water nozzles and mounts, deluge plumbing, hand hose components, and suction screens, shall be warranted against rust perforation and corrosion perforation for the "LIFETIME" of the sweeper, as defined as the ownership period by the original purchaser of the new sweeper. The hopper shall have a Stainless-steel Shroud enclosing the auxiliary engine, muffler, blower housing, fuel tank, and hydraulic tank and cooler. The hopper shroud shall have a minimum of 1" thick sound dampening material attached to the inside of shroud in the engine compartment area. Sound deadening material must consist of at least 48 Square feet of material. The shroud must be an integral part of the hopper and lift when the hopper is raised. The hopper roof shall be higher at the center to allow water to run off and to reduce corrosion. The suction tube entering the hopper and pressure tube exiting the hopper shall be bolt on for easy replacement and constructed of abrasion resistant steel. A hopper door open/close switch shall be mounted on the console to allow rear door to be operated from inside cab. The hopper floor shall be constructed with a High Strength Stainless-steel. The roof, bulkhead, rear door, and sides shall be constructed of a minimum of 10 gauge Stainless-steel. The hopper floor shall slope 3 degrees towards the rear door. The rear door shall include an in-cab door open indicator warning light. The hopper shall include an in-cab hopper up indicator warning light.

OR

The hopper shall be constructed of 10-gauge steel sides, and a quarter inch steel floor. Volumetric capacity shall be 8 cubic yards minimum. The hopper floor angle shall be a minimum of 10 degrees. The hopper shall have an external hopper prop. A removable, adjustable, abrasion resistant "scoop" style steel deflector shall be located at the suction inlet. The hopper rear door shall be hinged at the top of the door and opened by means of a hydraulic cylinder. The hopper door shall open first prior to tilting the hopper. The hopper rear door shall open at

a minimum angle of 90 degrees and be perpendicular to the hopper opening. Hydraulic cylinder movement for hopper dump shall consist of in-cab dump switches - hopper raise/lower and hopper door open/close - with supplemental weatherproof switches located on the exterior right side of sweeper. The rear hopper door shall have an external door prop. The hopper rear door shall include an automatic lock mechanism for a tight fit and optimal sealing between the hopper and the rear door. The rear door seal shall be a water resistant heavy-duty reinforced D style rubber seal for optimal sealing. Two 34.5" x 43.5" screens, for a total screen area 3000 square inches, of not less than 11-gauge steel shall be installed to allow air to move freely from the hopper into the centrifugal dust separator. The hopper screens shall be hinged and easily lowered for cleaning and inspection without tools or pin's removal. The LifeLiner Hopper System, if available, shall be provided to protect the hopper against corrosion and wear and to facilitate the removal of the debris when dumping. This liner system shall provide protection such that the hopper will be warranted for the life of the sweeper. An inspection door shall be built into the right side of the hopper. An 8 in. (203 mm) diameter, 9.5 ft. (2,896 mm) long wandering hose shall be located at the rear of the machine. Push buttons shall be mounted on the suction nozzle to control the hydraulically assisted up and down movement of the nozzle. Spray water shall be injected for dust control and hose lubrication. A (4) 4 ft. aluminum wandering hose extensions shall be added to the system.

Blower

Heavy-duty steel blower shall be used to create air pressure and suction (regenerative air) for removing debris from road surface. Blower shall be powered by the sweeper auxiliary engine via a heavy-duty 5-groove v-belt. A belt safety guard shall be supplied. The blower shall be a closed face turbine type with 10 curved blades and shall be 32.75-inch diameter by 5 inches wide. The blower shall be constructed of 500 Brinell hardness abrasion resistant steel. Fan shall be fully balanced within 1.5 grams on both sides for long fan and bearing life. The blower shall have a minimum rated performance of negative 65 inches of water column and 17,000 CFM. The blower shall be Whisper Wheel equipped to provide a 360-degree average dB(a) rating of 72.0 or less at an unobstructed distance of 50 feet at 2000 engine RPM. Sound dampening material is required in the area of the auxiliary engine and blower to aid in soundproofing. The blower housing shall be constructed of 3/16" abrasion resistant steel with the inside of the housing covered by a replaceable rubber wear liner. Blower housing shall have a vacuum enhancer for discharging a portion of the blast air for sweeping light materials such as leaves and paper. The vacuum enhancer shall be electrically powered by a DC actuator and controlled from a switch located on the control panel inside the cab. The vacuum enhancer to be capable of 0 - 80% air diversion for maximum control. Blower housing shall not be an

integral part of the hopper and shall be mounted parallel with the front of the hopper. Blower shall be mounted on sealed self-aligning anti-friction bearings. Blower shaft shall have greaseable bearings requiring 1/4 ounce of grease every 250 hours to ensure maximum life expectancy. Blower shaft shall be a minimum of 36 inches long and 2 1/4" in diameter to reduce stress or premature bearing wear. Grease points shall be accessible from ground level.

OR

Blower shall be hydraulically driven by a 2.87 cu-in (47 cc) displacement bent axis compact motor for maximum performance and simplicity of operation. Blower shall be directly coupled to the hydraulic motor, using jaw-type coupling. The single-engine system, driven by the variable speed device, shall provide all horsepower for blower speed of 3300 RPM to effectively convey the bulk of material into the debris hopper. Blower shall be a closed face turbine type, 31 3/8 in. diameter, with 9 vanes constructed of Hardox 500 steel abrasion resistance for maximum service life. For longevity of the blower and maximum bearing life, the blower must be balanced to within .5 ounce-inches. The blower housing shall be constructed of 10-gauge steel and lined with 150MIL thick polyurethane bolt in liners - liner replacement does not require blower to be removed from housing. Blower housing shall have an inspection door for access to blower without removing the blower housing or looking into the air exhaust opening. Blower housing shall not be an integral part of the hopper. Replacement of the blower housing must be possible without any cutting and/or welding of the housing and or hopper. The blower must not be directly exposed or open to the dust separator to preclude carry-over of material from the separator into the blower and blower housing. The blower shall be equipped with an electric actuated Flow Blocker, which can be controlled from within the cab, incorporated on the inlet side of the blower housing that minimizes fugitive dust during the raising or lowering of the pickup head.

Pickup Head

Pickup head shall be spring balanced all steel fabricated with separate upper and lower chambers where pressurized air is blasted from the upper chamber through an elongated blast orifice to the lower chamber. The blast orifice shall be replaceable and shall have a replaceable rubber leading edge and be angled a minimum of 3 degrees towards the suction side of the pickup head. The pickup head shall not be less than 90 inches wide and 36 inches long giving a total head area of 3240 square inches. Pressure and suction hoses shall be fourteen inches in diameter and be constructed from 3/8-inch-thick heavy-duty molded wire and reinforced

molded rubber. Sweeping paths shall be: Pickup head only = 90 inches, Pickup head and one side broom = 117 inches, Pickup head and two side brooms = 144 inches. Sweeper shall have Sweeps-in-Reverse which allows it to sweep in both forward and reverse with the head down without causing damage to the head or other components. Sweeper must be able to sweep in reverse while making turns. Pickup head shall be equipped with doublewide full-length virgin carbide drag shoes for maximum life. Front and rear of drag shoe shall be snowshoe design. Shoes shall be interchangeable from either the left or right side. Drag shoes shall be warranted against wear-out for a minimum of two years/2000 hours, prorated. Sweeping head shall be raised and lowered hydraulically by a single switch located in the cab. Head shall have a quick disconnect at the lower section of the head suction tube. Suction transition shall include two high volume water nozzles.

OR

The pickup head shall be a spring-supported, all steel fabricated pickup head with separated upper and lower chambers where pressurized air is blasted from the upper chamber through an elongated blast orifice, to the lower vacuum chamber. The pickup head shall not be less than 90 inches wide and 30 inches long for a total area of 2700 square inches. The pickup head shall have a minimum of 14-inch diameter pressure hose that connects the blower outlet with the pickup head. The pickup head shall have a minimum 12 3/4-inch diameter suction hose with a quick disconnect coupling at the lower end near the pickup head. The pressure side shall be equipped with a pressure relief valve/vacuum enhancer/leaf bleeder, for optimum leaf and light debris sweeping. The front and rear debris curtains shall be removable without removing the pickup head from the unit. Sweeping paths: Pickup head only = 90 inches, one side broom and pickup head = 117 inches, two side brooms and pickup head = 144 inches. The pickup head shall be equipped with side mounted adjustable steel runners with carbide inserts with a minimum width of 1 1/8 inches for long life. The pickup head shall be raised and lowered hydraulically by a rocker switch on the control panel inside the cab.

Brooms

Dual side brooms shall be 44" minimum diameter, flattened wire filled vertical digger type brooms for removing debris from gutter area. Side brooms shall be hydraulic motor driven and shall be positioned laterally and vertically by a hydraulic cylinder and springs. Each side broom shall have an adjustment to allow downward compensation for bristle contact, pattern and wear and shall be full floating to follow street contour. Each side broom shall have lateral flexibility to swing inward 15" under the chassis when encountering the impact of an

immovable object. Each side broom shall be held in the up and transit position by use of a hydraulic cylinder and an electric lock valve attachment. Upward motion for side broom storage shall be regulated by an adjustable flow control valve. Side broom disk shall be recessed to prevent such items as string and small rope like material from being wrapped around and damaging the side broom motor shaft seal. The disk shall be designed as to allow water to drain off. A center deflector shall be provided to direct debris thrown by the side brooms into the path of the pickup head. Deflector shall be positioned under the belly of the sweeper and in between the side brooms. Deflector shall raise and lower with the pick-up head. Each side broom shall additionally incorporate a hydraulically actuated tilt capability of 27 degrees, remotely controlled from the console in the cab. Each side broom shall be equipped with Side broom Extension Override (GEO) with in-cab controls to be able to extend and retract while in sweeping mode. This system shall be adjustable from full extension to the curb with in-cab variable adjustments to a full retraction under the sweeper. All controls shall be in-cab. At no time shall the operator have to leave the cab to activate this function. The system shall be activated by an electric linear actuator. Each side broom motor shall have a heavy-duty seal, seal slinger/protector and heavy duty bearing. Each side broom shall have an in-cab variable speed control independent of the sweeper auxiliary engine RPM. This shall include a rocket switch for each gutter mounted on the sweeper console.

OR

The right and left side broom shall be a free-floating trailing arm design with inward motion safety. The trailing arm shall be of a parallelogram design for simple, non-binding action/motion and for constant bristle and wear pattern. The side brooms shall be 42-inch diameter minimum, with hydraulically driven rotation. Brooms shall be pneumatically raised, lowered and suspended. Adjustable down pressure shall be pneumatically controlled by the operator from the cab in order to maintain proper surface contact consistently during vertical broom travel. The broom hydraulic motor drive shall provide not less than 6045 in/lbs. of torque. The side broom assemblies shall have greaseless pivot pins. The side broom assemblies shall be held in the storage position by a positive means to support broom during travel. Each side broom shall be controlled from in the cab by simple rocker switches. An electrically operated tilting mechanism shall allow operator to change inward/outward tip of the right side broom. The angle shall be changeable from the cab while sweeping. An electrically operated tilting mechanism shall allow the operator to change inward/outward tip of the left Side broom. The angle shall be changeable from the cab while sweeping. The side broom control system shall allow the broom to be retracted while sweeping. This feature shall be controlled from the operator console.

Water Spray System

Water spray shall be supplied by twin electric diaphragm water pumps. The water pumps shall produce a minimum of 60 PSI, with a minimum 5.88 gpm each. The water pumps shall automatically disengage when the water supply is depleted, or the pre-filter is clogged. A pre-filter filter minder shall also be provided. Pumps shall be mounted below water tank bottom level. Water tank capacity shall not be less than 600 gallons and shall be constructed of polyethylene. A minimum 25-foot long fire hydrant fill hose shall be provided with 2.5" NST coupling to fill water tank. A minimum 2" air gap shall be provided between water fill tube and water tank. The hydrant hose shall include a hydrant wrench and hose storage rack. The water system shall be filtered by a 50-mesh cleanable filter with restriction indicator located between the tank and water pump. Water filter shall be at ground level. Water shut-off valve shall be provided. Two (2) adjustable spray nozzles shall be located at each gutter broom. Dust suppression system shall include two spray nozzles at the front axle. Left nozzle shall come on when left gutter broom water is in use and right nozzle shall come on when right gutter broom water is in use. Each water spray function shall have its own independent on/off cab-controlled solenoid valve. An in-cab water level gauge and an in-cab low water level alarm located on the sweeper console must give operator constant visibility of water system levels. Water spray nozzles shall be provided as follows: five (5) nozzles at pickup head, two (2) nozzles inside hopper, two (2) nozzles at right gutter broom, two (2) nozzles at left gutter broom, two (2) nozzles in the suction tube, and two (2) at the front axle. No part of the water system shall be made with ferrous metal. The water system shall incorporate an air purge system. Sweeper shall be equipped with a front spray bar with Seven (7) nozzles. Spray bar shall be mounted on front bumper. Sweeper to have an auxiliary hand hose, that includes an engine throttle control. Hand hose to be 8" in diameter, 12' long, with power boom and 52" long serrated tip collection nozzle. Hand hose shall be stored on the rear of the sweeper. Hand hose shall be rubber. A block off plate to divert airflow to the hand hose shall be provided. Block off plate to fit in toolbox.

OR

The water tank shall be a removable, 240 gal. minimum total capacity. The tank shall be constructed of rust proof polyethylene with a manufacturer's warranty for lifetime protection against rust-through. The water tank shall be frame mounted with no part sharing any common wall with the hopper and shall not raise during body dumping. A water level gauge shall be provided on the control console within the cab. All water lines shall be color coded for easy

identification. The water filter must be easy to access and clean without tilting the hopper. A ball valve shall be provided at the filter inlet. All water piping shall be external to the operator cab. No water lines capable of leaking or bursting shall be within the cab. Three (3) water spray nozzles shall be located at each side broom. A pivoting bracket shall be provided to allow for positioning of the side broom spray nozzles. Seven (7) easily removable water spray nozzles shall be located inside the pickup head. Three (3) removable water spray nozzles shall be located at the lower portion of the suction hose. Two electric 12-volt, diaphragm type pumps shall provide a combined flow of 8 GPM @ 40 PSI to the pickup head, the suction hose and the side brooms. One water pump shall be dedicated to supplying water to the pickup head and the suction hose for dust control. One water pump shall be dedicated to the side brooms for dust control. Each water pump shall have two flow rates, selectable by the operator from within the cab and capable of running dry without damage. A 25 ft. (7620 mm) hose to fill the water tank shall be provided in lieu of the standard 16 ft. 8 in. (5080 mm). System shall include a high-pressure pump with 24 in. (610 mm) hand lance and 30 ft. (9m. 140mm.) hose. It shall provide a minimum of 4.2 GPM (15.9 L/m) at 1500 PSI. The hose shall have an attached spray wand with on/off trigger and with two nozzle settings allowing the operator to spray fine or wide. The quick disconnect for the high pressure wash down shall be easily accessible on the right side of the sweeper. The water system shall be capable of being purged of water using pressurized air. The sweeper air system shall be utilized to provide air pressure using a manual valve control.

Paint

Color shall be manufacture's standard color of white.

SPECIAL INSTRUCTIONS

The successful bidder shall be required to compile all manuals, operation guides, warranty information, etc. on the special equipment in ring binders. The binders shall be compiled according to serial numbers of equipment mounted in each truck. The successful bidder shall provide training lights, PA system, message board operation, air compressor, and jump start system. Training shall be a minimum one-day class of operation, maintenance and troubleshooting for each component at each FOB destination.

PARTS AND SERVICE

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of FOB delivery location to be considered for an award. This must be a full-service franchised dealership which includes:

- Sales Management
- Field Representatives
- Manufacturer's required specialized tools
- Fully equipped service trucks
- Factory trained technicians

Warranty

Warranty shall be standard manufacture's warranty unless stated otherwise above.